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HARDINESS IN PROFESSIONAL SPANISH FIREFIGHTERS¹

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Summary.—As a high risk, physically demanding, and stressful profession, fire-fighting presents an ideal context for the study of hardiness. Hardiness of professional Spanish firefighters was assessed. Participants (53 firefighters; *M* age = 36.1 yr., *SD* = 8.2) volunteered to complete the adapted Spanish version of the Personal Views Survey. Results showed that participants' mean Hardiness score was slightly high. Hardiness was influenced by years of service. Spanish firefighters present a homogenous set of personal characteristics related to managing stressful working circumstances. The effect of experience on Hardiness levels is discussed.

The hardiness concept emerged from the research conducted by Kobasa (1979) on the personal characteristics that help people to successfully turn stressful circumstances into growth opportunities. Hardiness can, therefore, be conceived as an individual's propensity to manage demands of situations ranging from an absolute resilience to extreme vulnerability (Maddi, 2006). Hardiness is a stable personality trait and has been conceptualized as an amalgam of cognitions and emotional and behavioral characteristics (Maddi, 2006). Hardiness buffers the effects of stressful life events (Clough, Earle, & Sewell, 2002; Moreno, Morett, Rodríguez, & Morante, 2006).

Hardiness comprises commitment, control, and challenge dimensions (Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982; Maddi, 2006). Commitment is the tendency to involve oneself in, rather than alienate oneself from, activities of life (Maddi, 2006). Control is the tendency to think, feel, and act as if one is influential rather than passively helpless. Challenge is an expectation that life is unpredictable and that changes will stimulate personal development. Nevertheless, hardiness must be considered as a global construct (Kobasa, 1979; Maddi, 2006). Hardiness is learned, rather than inborn (Khoshaba & Maddi, 2001), and is developed by coping with and surviving personal experiences.

The positive influence of hardiness on performance has been observed in diverse samples: military, educational, leadership, and health care professionals, and athletes (Maddi & Hess, 1992; Ford, Eklund, & Gordon, 2000; Clough, Earle, & Sewell, 2002; Rogers, Alderman, & Landers, 2003;

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Golby & Sheard, 2004; Jaenes, Godoy, & Román, 2008; Bartone, Eid, Johnsen, Laberg, & Snook, 2009; Sezgin, 2009; Sheard, 2009; Sheard & Golby, 2010; de la Vega, Rivera, & Ruiz, 2011). Specifically, in the military context, Maddi, Matthews, Kelly, Villareal, and White (2012) suggested that hardiness may play an especially important role in mediating stress in military populations. In addition, Skomorovsky and Dudom (2011), working with the Canadian military, reported that hardiness was an important predictor of well-being and stress. In the context of endurance sports, de la Vega, *et al.* (2011) reported that ultra, long distance runners showed high hardiness ($M = 71.88$, $SD = 7.89$ from a maximal score of 100). Shelby and Golby (2010) concluded that higher hardiness scores distinguish elite athletes from other performers; they reported that international-level athletes presented higher hardiness scores than national-level athletes ($M = 39.09$, $SD = 5.86$ vs. $M = 36.17$, $SD = 6.15$ from a maximal score of 49).

Firefighting is known to be a dangerous and physically demanding occupation. Professional firefighters are often exposed to traumatic stress, from exposure to life-threatening situations, physically demanding activities, and property destruction (Brown, Mulhern, & Joseph, 2002). Some activities of firefighting are energetically high and could lead to excessive fatigue (Bos, Mol, Visser, & Frings-Dresen, 2004). The firefighter's duties involve dangerous situations and physically demanding exertion, such as responding to fire alarms and rescue situations like storms, car accidents, urban rescue, and floods. In addition to dangerous duties, the pressures of professional firefighters require working both inside and outside exposed to the elements, following strict safety procedures, and often enduring periods of sleep deprivation. In Spain, firefighters work on rotating shifts of 24 hours on duty and 72 hours of rest. Firefighters follow a routine which can be compared with that of other professionals, such as the military (Subramanian & Vinothkumar, 2011).

In such a risky, stressful, and physical demanding work context, hardiness would seem especially valuable. In this exploratory study, the hardiness construct was investigated in professional Spanish firefighters.

Hypothesis 1. Firefighters will have high hardiness scores.

Hypothesis 2. Since hardiness is learned and reinforced by personal experiences, years of service as firefighters will be associated with hardiness scores.

METHOD

Participants

Professional firefighters ($N = 53$; all male), with ages ranging from 26 to 60 years ($M = 35.48$, $SD = 7.53$) were recruited as volunteer partici-

pants. Mean length of service was 8.69 ($SD = 7.51$). They were informed of the voluntary nature of their participation and were assured that all answers would be confidential. Permission of the institutional ethics committee was obtained and all participants provided informed consent prior to participation.

Measures

The adapted Spanish version of the Personal Views Survey (PVS, Hardiness Institute, 1985) was administered. This scale consists of 30 items that assess the three hardiness dimensions Commitment, Control, and Challenge. Each subscale has 10 items that are rated on a 4-point, Likert-type scale with anchors 0: Totally disagree and 3: Totally agree. Most items ($n = 25$) are reverse scored (i.e., "No matter how much effort I invest, I will not get anything"). Scores for each subscale are obtained, following the manual, by adding the scores after reverse scoring of some items, dividing by 30, and multiplying the result by 100; therefore, total hardiness scores range from 0 to 100, with high scores indicating higher hardiness. The full scale was reported to have a Cronbach's alpha of .79, Commitment .71, Control .59, and Challenge .42 in a sample of ($N = 189$) marathon runners (Jaenes, *et al.*, 2008). This scale is widely used in the sport psychology context, and is appropriate for the study of hardiness in stressful physical and psychological activities.

Procedure

All participants were asked about their age and years of service in the firefighters' corps. Participants from six different firefighters' groups were recruited. Data were collected in a private room at their workplace. Participants were specifically instructed how to use the response scale on the PVS, according to the manual (Jaenes, *et al.*, 2008).

Analysis

An analysis of covariance (ANCOVA) was employed to identify significant composite differences. Hardiness scores served as the dependent variable; age and years of experience were covariates. A Kolmogorov-Smirnov one-sample test was performed to confirm normal distribution. Age, years of service, Hardiness, Commitment, Control, and Challenge all had normal distributions. Skew and kurtosis were calculated for all the variables and were well within reasonable range. Spearman's ρ was used to measure the statistical association between participants' age and years of service. As a test applied to a new population, the reliability coefficients Cronbach's α and McDonald's ω were calculated using the statistical software package R (R Development Core Team, 2011). Alpha was set at .05.

TABLE 1
DESCRIPTIVE STATISTICS (*M*, *SD*) AND CORRELATIONS AMONG HARDINESS AND SUBSCALES,
YEARS OF SERVICE, AND AGE

Scale	α/ω	<i>M</i>	<i>SD</i>	Correlation				
				1.	2.	3.	4.	5.
1. Total Hardiness	.60/.58	60.83	8.15		.62†	.74†	.87†	
2. Commitment	.54/.57	48.80	10.21			.15	.37†	
3. Control	.22/.23	65.03	10.34				.54†	
4. Challenge	.34/.17	68.67	11.64					
5. Service		8.69	7.51	-.07	.02	-.14	-.04	
6. Age		35.48	7.53	.007	.11	-.10	.02	.81†

† $p < .01$.

RESULTS

The ranges of scores for each variable were: total Hardiness 43.33–77.78, Commitment 33.33–83.33, Control 46.67–86.67, Challenge 43.33–93.33. Age ranged from 26 to 56 years and years of service from 6 months to 25 years. Since age and years of service were correlated ($r = .81, p < .001$), analysis of covariance (ANCOVA) was run for each Hardiness subscale score controlling age. Descriptive data and correlations among variables are presented in Table 1. The analyses of covariance showed significant effects of years of service on total Hardiness score (Table 2).

TABLE 2
ANALYSES OF COVARIANCE (ANCOVA): EFFECT OF YEARS OF SERVICE
ON HARDINESS AND ITS SUBSCALES, CONTROLLING AGE

Scale	<i>MS</i>	F_{52}	<i>p</i>	η^2
Total Hardiness	289.09	5.04	.01	0.17
Commitment	319.22	3.42	.04	0.12
Control	178.68	1.69	.19	0.06
Challenge	488.7	3.96	.02	0.14

DISCUSSION

Firefighting requires excellent physical and mental capacity. As a high-risk and stressful profession, firefighting represents an ideal context for the study of the hardiness construct. Results indicated that participants' Hardiness scores were slightly higher than the scale midpoint of 50 ($n = 25$ firefighters scored above 50; $n = 14$ above 75). Hypothesis 1 was partially supported, with a mean Hardiness of 60.83 ($SD = 0.15$); firefighters' scores are slightly high. Nevertheless, there is no cutting score

established for high Hardiness scores. Theoretically, the classification is based on the scores obtained, higher scores indicating more hardiness.

Results also showed an effect of years of service on the Hardiness scores. This could be based on experience in firefighters' profession duties, without considering their age. The results seem to support the role of personal experience (Kobasa, 1979; Kobasa, *et al.*, 1982) in development of hardiness and related attitudes. It would interesting to assess whether firefighting training includes training to enhance hardiness, based on the effectiveness of such training in other stressful and physically demanding contexts, such as the military (Maddi, *et al.*, 2012).

The firefighters' mean Hardiness score was similar to those reported in other samples exposed to stress-inducing contexts and assessed with the same scale, e.g., marathon runners ($M = 67.39$, $SD = 12.39$ in a sample of $N = 189$ participants; Jaenes, *et al.*, 2009) and ultra-marathon athletes ($M = 71.88$, $SD = 7.89$ in a sample of $N = 69$ athletes at a national level; de la Vega, *et al.*, 2011). These are also contexts in which strong commitment, control and challenge are important for successful performance. Using the English version of the Personal Views Survey PVS III-R (Maddi & Khoshaba, 2001), in the military context, Maddi, *et al.* (2012) obtained a mean Hardiness score of 36.69 ($SD = 5.63$) out of the maximum possible score of 54. Skomorovsky and Dudom (2011), working with the Canadian military, observed that Hardiness scores were an important predictor of well-being and stress responses. In addition, Bartone, *et al.* (2009) found that hardiness predicted military development grades, and were a moderator of combat exposure stress. Descriptively, firefighters' Hardiness scores (average scores >60% of the maximum possible score) were similar to those obtained in the military context (Maddi, *et al.*, 2012) and with those obtained in the context of endurance sports such as marathons and ultra-marathons (Jaenes, *et al.*, 2009; de la Vega, *et al.*, 2011).

The results supported the idea of hardiness assessments in the selection of new recruits for the fire service department. In addition, Hardiness training may be useful as an addition to the current training procedures for the firefighters. Specifically, firefighters undergoing hardiness training will increase their courage and motivation to create positive outcomes from stressful circumstances.

Limitations and Future Research

The sample was relatively homogeneous. Age was not normally distributed, but years of service and Hardiness were normally distributed. Hardiness scores (range = 43.33 to 77.78) had a somewhat restricted range, which probably limited the correlations with other variables to some extent. In addition, despite the acceptable Cronbach's α of .79 for

the total Hardiness scale (Jaenes, *et al.*, 2008), the low internal consistency reliability of the Challenge subscale (.42) represents a limitation to interpretation of the data. Cronbach's α and McDonald's ω (a more appropriate reliability coefficient for multiple scales) were both calculated. With an ω of .58 compared to α of .60 for the total Hardiness scale, the reliability of the scale for the firefighters' population is low. The original study of the scale did not include a calculation of McDonald's ω , so no comparison of internal consistency reliability between samples is possible. The subscales of Commitment ($\omega = .57$; $\alpha = .54$), Control ($\omega = .23$; $\alpha = .22$) and Challenge ($\omega = .17$; $\alpha = .34$) all presented low internal consistency. Clearly, the Hardiness scale in the Spanish version of the Personal Views Survey needs psychometric work. Despite the common roots with the PVS III-R, the Spanish Hardiness scale presents 12 more items ($N = 30$) than the 18 of the PVS III-R. In order to establish common criteria among hardiness researchers, it would be valuable for assessment tools to be co-standardized and, most importantly, have good internal consistency reliability.

Future research should focus on the development of new items to overcome the limitations of the current Hardiness scale. In addition, it would be interesting to examine convergent validity between Hardiness and other relevant psychological constructs (i.e., resilience, coping strategies, burnout) to establish relationships and models for practical research in psychology contexts.

REFERENCES

- BARTONE, P. T., EID, J., JOHNSEN, B. H., LABERG, J. C., & SNOOK, S. A. (2009) Big Five personality factors, hardiness, and social judgment as predictors of leader performance. *Leadership & Organization Development Journal*, 30(6), 498-521.
- BOS, J., MOL, E., VISSER, B., & FRINGS-DRESEN, M. (2004) The physical demands upon (Dutch) fire-fighters in relation to the maximum acceptable energetic workload. *Ergonomics*, 47(4), 446-460.
- BROWN, J., MULHERN, G., & JOSEPH, S. (2002) Incident-related stressors, locus of control, coping and psychological distress among firefighters and in Northern Ireland. *Journal of Traumatic Stress*, 15(2), 161-168.
- CLOUGH, P. J., EARLE, K., & SEWELL, D. (2002) Mental toughness: the concept and its measurement. In I. Cockerill (Ed.), *Solutions in sport psychology*. London, UK: Thomson Publishing. Pp. 32-43.
- DE LA VEGA, R., RIVERA, O., & RUIZ, R. (2011) Personalidad resistente en carreras de fondo: comparativa entre ultra fondo y diez kilómetros [Hardiness in endurance races: a comparison between skyrunning and ten kilometers]. *Revista de Psicología del Deporte*, 20,(2), 445-454.
- FORD, I. W., EKLUND, R. C., & GORDON, S. (2000) An examination of psychosocial variables moderating the relationship between life stress and injury time-loss among athletes of a high standard. *Journal of Sports Sciences*, 18, 301-312.
- GOLBY, J., & SHEARD, M. (2004) Mental toughness and hardiness at different levels of rugby league. *Personality and Individual Differences*, 37, 933-942.

- JAENES, J. C., GODOY, D., & ROMÁN, F. J. (2008) Elaboración y validación psicométrica de la escala de Personalidad Resistente en Maratonianos (EPRM) [Psychometric elaboration and validation of the hardy personality scale in marathon runners]. *Cuadernos de Psicología del Deporte*, 8(2), 59-81.
- JAENES, J. C., GODOY, D., & ROMÁN, F. J. (2009) Personalidad resistente en maratonianos: un estudio sobre el control, compromiso y desafío de corredoras y corredores de maratón [Hardy personality in marathon runners: a study of male and female runners' control, commitment and challenges]. *Revista de Psicología del Deporte*, 18(2), 217-234.
- KHOSHABA, D. M., & MADDI, S. R. (2001) *HardiTraining*. Newport Beach, CA: Hardiness Institute.
- KOBASA, S. C. (1979) Stressful life events, personality, and health: an inquiry into hardiness. *Journal of Personality and Social Psychology*, 37, 1-10.
- KOBASA, S. C., MADDI, S. R., & KAHN, S. (1982) Hardiness and health: a prospective study. *Journal of Personality and Social Psychology*, 42, 168-177.
- MADDI, S. R. (2006) Hardiness: the courage to grow from stresses. *Journal of Positive Psychology*, 1, 160-168.
- MADDI, S. R., & HESS, M. J. (1992) Personality hardiness and success in basketball. *International Journal of Sport Psychology*, 23, 360-368.
- MADDI, S., MATTHEWS, M., KELLY, R., VILLAREAL, B., & WHITE, M. (2012) The role of hardiness and grit in predicting performance and retention of USMA cadets. *Military Psychology*, 24, 19-28.
- MORENO, B., MORETT, N. I., RODRÍGUEZ, A., & MORANTE, M. E. (2006) La personalidad resistente como variable moduladora del síndrome de burnout en una muestra de bomberos [Hardiness as moderator variable of burnout syndrome in firefighters]. *Psicothema*, 18(3), 413-418.
- R DEVELOPMENT CORE TEAM. (2011) *R: a language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from <http://www.R-project.org>.
- ROGERS, T. J., ALDERMAN, B. L., & LANDERS, D. M. (2003) Effects of life-event stress and hardiness on peripheral vision in a real-life stress situation. *Behavioral Medicine*, 29, 2126.
- SEZGIN, F. (2009) Relationships between teacher organizational commitment, psychological hardiness and some demographic variables in Turkish primary schools. *Journal of Educational Administration*, 47(5), 630-651.
- SKOMOROVSKY, A., & SUDOM, K. (2011) Psychological well-being of Canadian forces officer candidates: the unique roles of hardiness and personality. *Military Medicine*, 176(4), 389-396.
- SHEARD, M. (2009) A cross-national analysis of mental toughness and hardiness in elite university rugby league teams. *Perceptual & Motor Skills*, 109(1), 213-223.
- SHEARD, M., & GOLBY, J. (2010) Personality hardiness differentiates elite-level sport performance. *International Journal of Sport & Exercise Psychology*, 8, 160-169.
- SUBRAMANIAN, S., & VINOTHKUMAR, M. (2011) Hardiness and adjustment as predictors of psychological well-being and distress of military school students. *Amity Journal of Applied Psychology*, 2(1), 11-17.